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FOREST SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE
ALLEGHENY FOREST EXPERIMENT STATION*

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Technical Note No. 14.

TREE FORM AND DEFECTS IN
YOUNG BEECH-BIRCH-MAPLE-HEMLOCK STANDS

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During the establishment of 48 tenth-acre wooding plots on the Kane Experimental Forest in 1936, an average of 253 crop trees per acre were described as to form and defects. These records have been summarized to give an idea of the tree conditions to be encountered in stand improvement work in young growth in the beech-birch-maple-hemlock type. The records were obtained on twelve plots in an eighteen-year-old stand and twelve plots in each of three thirteen-year-old stands. Except for the height and crown width tables, the data given apply to selected crop trees and not to the entire stands.

Table 1 - Proportion of crop trees in various form classifications by species (all plots)

Species	: Basis -	:	:	: Crook	: Perfect
	: Total No.	: Forked	: Leaning	: Exceeding	: in
	: of trees	:	: 10° or more	: 1/2 foot	: form
(Percent of Total No.)					
Red maple	67	28	30	12	43
Black cherry	587	26	26	9	51
Sugar maple	519	18	19	6	63
Hemlock	24	16	4	8	71

A surprising proportion of the crop trees are forked or leaning. Crop trees of red maple and black cherry have the poorest form, although most of the red maple in this sample were located in a generally poor stand.

Table 2 - Relative heights of different species at 13 years.

Species	Average Height (ft.)
Pin cherry	24.4
Black cherry	22.6
Red maple	19.2
Sugar maple	17.1
Beech	12.5

These measurements were obtained on one plot where tree origins are characteristic of second growth. Most of the beech were suckers, most of the sugar maple seedling sprouts, and most of the other species were seedlings.

*Maintained at Philadelphia, Pennsylvania, in cooperation with the University of Pennsylvania.

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Table 3 - Relation of crown spread to diameter in young stands (13 and 18 years of age)

Diameter class (inches)	Crown diameter (in foot) by species		
	Sugar Maple	Black Cherry	Red Maple
1	4.9	5.3	5.6
2	6.9	7.2	8.3
3	9.0	9.0	10.9
4		10.9	13.4
5		12.8	
6		14.7	

Table 4 - Prevalence of bole defects of crop trees, by species. (all plots)

		% Defective, by type of Injury					
Species	No. of trees	Total % Defective	Minor	Mechanical	Rotted	Noctria	Rodent
			Bark Injury	Bark Injury	Stub at Base	Canker	Scars
Sugar maple	519	46	18	16	17	6	2
Red maple	67	40	13	12	18	4	0
Beech	18	39	22	11	6	0	6
Black cherry	587	13	9	2	2	1	0
Homlock	24	12	4	4	0	0	8
All species	1235	29	13	9	9	3	1

The species are arranged in the table in order of apparent susceptibility to bark injury, which depends largely upon relative bark thickness. The basis is weak for beech and homlock, but the very considerable difference in susceptibility between maples and black cherry is well founded. Only 13% of the black cherry trees are defective, as compared with 46% of the sugar maples. Rotted stubs of parent stumps are particularly common in the maples, but it is probable that the complete disappearance of the stubs will precede the formation of rot-susceptible heartwood in the younger crop trees of this species.

Noctria cankers are more frequent on the maples than on black cherry (table 4). Rodent scars, attributed for the most part to porcupines, are most common on homlock and beech. Of the 587 black cherry crop trees, none was gnawed by rodents. Porcupine injuries have been observed in considerable numbers on older black cherry trees in nearby localities, however.

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C. E. Ostrom
Junior Forester